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TITLE: Signal amplifier circuit
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INVENTOR-INFORMATION:

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US-CL-CURRENT: 330/254, 330/136, 330/279

ABSTRACT:

The present invention discloses a signal amplifier circuit used in, for example, a receive portion in an optical communication system, and including an automatic threshold value setting portion to automatically set a threshold value depending upon a "1" side level and a "0" side level of an input signal, an automatic gain control amplifying portion to take as inputs the input signal and the threshold value from the automatic threshold value setting portion so as to perform differential amplification, and a gain control portion to detect amplitude information of the input signal so as to feed a gain control signal according to amplitude of the input signal to the automatic gain control amplifying portion as a feedforward signal. It is thereby possible to avoid limitation of a signal amplified in the signal amplifier circuit at a time of reproduction of a pulse signal, and compensate for offsets present in circuits so as to suppress a variation in pulse width of the output signal.

50 Claims, 41 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 32

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Detailed Description Text - DETX (90):

On the other hand, the minimum gain G.sub.min is a value designed such that a value of a signal amplified in the AGC amplifier circuit

27 does not exceed a linear range [see limiter amplitude L shown in FIG. 11(a)] of the AGC amplifier circuit 27 (in other words, does not fall within a limiter area of the AGC amplifier circuit 27) even when a signal having maximum amplitude (maximum input level) is input into the AGC amplifier circuit 27.

Detailed Description Text - DETX (91):

Specifically, the minimum gain G.sub.min which does not exceed the linear range of the AGC amplifier circuit 27 can illustratively be described as:

Detailed Description Text - DETX (92):

where V.sub.linear : linear range of output from AGC amplifier circuit 27; and

Detailed Description Text - DETX (110):

Nevertheless, in the embodiment, as stated above, the gain control circuit 26 controls the AGC amplifier circuit 27 to operate in the linear range. Then, it is possible to configure the offset compensation feedback loop 28 using the peak value of the output signal from the AGC amplifier circuit 27.

Detailed Description Text - DETX (126):

As set forth above, according to the first embodiment of the present invention, the signal amplifier circuit 20 includes the ATC-AGC amplifier circuit 21 having the ATC circuit 22, the gain control circuit 26, and the AGC amplifier circuit 27, and the gain control circuit 26 is used to control such that the AGC amplifier circuit 27 can be operated in its linear range throughout an amplitude level of the input signal. It is thereby possible to avoid the limitation of the signal amplified in the AGC amplifier circuit 27.

Detailed Description Text - DETX (218):

FIG. 17(a) is a waveform diagram of the differential output (positive-phase output) signals from the AGC amplifier circuit 67. As shown in FIG. 17(a), the output from the AGC amplifier circuit 67 continuously falls within a linear range [limiter amplitude L shown in FIG. 17(a)] of the AGC amplifier circuit 27.

Detailed Description Text - DETX (224):

On the other hand, as shown in FIG. 17(a), the AGC amplifier circuit 67 of the ATC-AGC amplifier circuit 61 is continuously operated in the linear range without limitation of signal. Therefore,

even in case of input of a signal having a high level sufficient to lose the linearity in the limiter amplifier circuit, it is possible to reflect a threshold level deviation produced by the offset in the linearity as the variation in output level.